



**Ernest Orlando Lawrence Berkeley National Laboratory**

**EARTH SCIENCES DIVISION**

**Integrated Safety Management Plan**

**ESD-ISM-1.0 Revision 9**

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### Change History

This Health and Safety Plan is reviewed and modified as necessary as part of the ESD Annual Self-Assessment to assure continual improvement. The following table outlines the change history to this Plan:

Revision	Change Date	Summary of Changes
REV 9	October 27, 2009	Addressed EH&S Division review comments, Subcontractors JHA and work authorization, and Building Manager and emergency team roles and responsibilities. Updated web links, made minor editorial changes.
REV 8	October 21, 2008	Addressed work lead, biological authorizations, electrical work, nano-material disposal, JHA, replaced HEAR with HMS, expanded on the role of the ERGO advocate, included a list of ESD controlled documents, editorial changes.
REV 7	September 2007	Reflect changes to PUB-3000; provided URLs in lieu of appendices
REV 6	February, 2005	Updated department names, opportunities for improvement; clarification of line management supervisor/PI EH&S responsibilities; ergonomic injury prevention policy; SAA policy; MOU w/ UCB; Lab-space Lead PI description; lab safety primer description.
REV 5	14 July, 2003	Minor update. Expanded explanation of work authorizations and process and expectation for students. Plan modified to include updated opportunities for improvement and appendices.
REV 4	February 2002	Significant revision. Improved accident investigation process, developed ergonomics initiative, changed process to better involve line management and changed procedure for matrixed employees. Updated opportunities for improvement and appendices.
REV 3	June 2001	Minor updates including updated opportunities for improvement and appendices.
REV 2	June 1999	Minor updates including updated opportunities for improvement and appendices.
REV 1	May 1997	Initial document developed under Integrated Safety Management System



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### 1. INTRODUCTION

The Earth Sciences Division (ESD) at Lawrence Berkeley National Lab (LBNL; Berkeley Lab) performs fundamental and applied geosciences research related to subsurface energy resources, nuclear waste disposal, environmental restoration and ecology, and climate change. ESD maintains experimental (laboratory and field) and computational core-capabilities in the disciplines of vadose and saturated zone hydrology, fracture hydrology, atmospheric and ocean sciences, petroleum and geothermal reservoir engineering, seismic and electromagnetic geophysics, isotope geochemistry, environmental microbiology and rock and soil physics. (For additional information refer to the ESD website at <http://esd.lbl.gov>.)

Each ESD staff member belongs to a Department (Climate Science, Ecology, Geochemistry, Geophysics, and Hydrogeology) aligned with their professional expertise, which also serves as their administrative home. Department Heads are responsible for safety, staffing, promotions, performance evaluations, and training matters. In addition, Department Heads have the overall responsibility of developing and maintaining the long-term scientific quality, productivity, and visibility of the department within a broad definition and scope of its particular discipline. Department Heads work with the Division Director and Space Coordinators to identify appropriate facilities to do the research, but do not control research funds. Administrative support is provided by Division Support Staff, led by ESD's Business Manager.

Research in ESD is conducted within six Programs (Climate and Carbon Sciences, Geologic Carbon Sequestration, Environmental Remediation and Water Resources, Energy Resources, Fundamental and Exploratory Research, and Nuclear Energy and Waste), which are aligned to our major DOE funding sources. Each Program is led by a Program Head who is the principal point-of-contact between ESD research and DOE (or other sponsors), and has a major responsibility for building and sustaining programs. Members of the ESD scientific/technical staff are assigned to work on one or more projects in these six Programs. Projects are led by one or more Principal Investigators (PIs), who typically develop the research proposal and obtain the funding contract. Employees typically work on more than one project during a fiscal year, and as a consequence often work under the direction of more than one PI. In addition, an employee can be a participant on one project and the PI for another project. Regardless of how many projects an employee works on or leads, that employee has only one Supervisor (also known as the Supervisor of Record as listed in Human Resources). The ESD Organization Chart can be found at <http://esd.lbl.gov/about/orgchart.html>.

The ESD Director is responsible for ensuring that the Division adheres to the principles of the LBNL ISM plan and complies with all Laboratory policies and procedures. ESD is committed to performing work safely and in a manner that ensures protection of employees, the public, Laboratory assets, and the environment. ESD's line and program management, its staff, contractors,



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students, and participating guests are responsible and accountable for the safe performance of work, will exert sufficient care, and provide resources toward the safe conduct of its operations.

Line Management, with respect to implementing safety and health policy, flows from the Lab Director to the Division Director, to Department Heads, to Supervisors, Principal Investigators, and Work Leads to employees. The Division Director, Department Heads, and Supervisors (which includes Program Heads and PIs) are part of the formal safety line management chain, and they have the responsibility for adherence to all LBNL safety and health policies and safe work practices. Work leads are assigned by the line management to assure that day-to-day work, operations, and activities in their assigned area(s) and activities are conducted safely and within established work authorizations.

In compliance with the LBNL and ESD Integrated Safety Management (ISM) Plan, the ESD management shall ensure that:

- work is defined and planned;
- work hazards are identified and analyzed before the work begins;
- work controls are developed and implemented to reduce the hazards and impacts associated with any activity to acceptable levels;
- work is performed as authorized and within the established controls;
- feedback, and continuous improvement is part of the work performance,

This information is also summarized in at-a-glance safety documents, posted in various ESD building locations and online at <http://esd.lbl.gov/resources/health&safety/atoz.html#a>.



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### 2. INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS) IMPLEMENTATION WITHIN ESD

The Berkeley Lab's Environmental Safety and Health (ES&H) policies and requirements are contained in the *Health & Safety Manual* (PUB-3000; <http://www.lbl.gov/ehs/pub3000/>), and the *Integrated Environment, Health & Safety Management Plan: Integrated Safety Management (ISM) System* (PUB-3140; <http://www.lbl.gov/ehs/ism/Title.html>), the *Regulations and Procedures Manual (RPM)* (<http://www.lbl.gov/Workplace/RPM/>), and LBNL Operating and Quality Management Plan (<http://www.lbl.gov/DIR/OIA/OCA/about/program-docs.html>). These documents implement the contractual agreement between the Department of Energy and the University of California, contained in UC Prime Contract (<http://labs.ucop.edu/labprimecontracts/>), Appendix B (Performance Evaluation and Measurement Plan) and Appendix I (DOE Directives) under LBNL Contract No. DE-AC02-05CH11231.

The ESD ISM Plan (referred to as the Plan) explains how the LBNL safety and health policies and procedures will be implemented in ESD. It defines the roles and responsibilities for ESD employees, students, visitors, participating guests, contractors and matrixed employees. LBNL work performed at the UC Berkeley campus must conform to the "*Partnership Agreement Between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures*" ([http://www.lbl.gov/ehs/ism/ucb\\_lbl\\_partnership\\_3\\_15\\_04.pdf](http://www.lbl.gov/ehs/ism/ucb_lbl_partnership_3_15_04.pdf)) dated March 15, 2004. The Plan will be reviewed and modified if necessary, as part of the Division's Annual Self-Assessment, to assure continuous improvement.

#### 2.1 Opportunities for Improvement

Through the self-assessment process, ESD continually obtains feedback and identifies opportunities for improvement of its safety and health program. These identified items are entered into the Corrective Action Tracking System (CATS) at <https://isswprod.lbl.gov/cats/login.aspx> and addressed in a timely manner. LBNL's Issues Management Program document (LBNL/PUB-5519) and CATS Database User Manual (OIA-OCA-0001) contain detailed guidance on issues identification, tracking, resolution, closure, validation, and effectiveness of corrective actions.

**Lessons Learned** are shared to improve operational ES&H by benefiting from the experience of others and they are prepared and distributed whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience, or product. LBNL has an established Lessons Learned program. ESD encourages employees to bring to the attention of their supervisor or Safety Coordinator topics that could serve as possible Lessons Learned.

A **near miss** is an event that could have caused a serious injury or illness, but didn't. Reporting these events helps facilitate continued safety practices in the work place. The provided information would enable the ESD management to communicate to the staff about these near misses with recommended or self-corrected actions and help avoid future accidents and injuries. All concerns



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should also be discussed with the Supervisor, Work Lead, PI of the project, or the Safety Coordinator and reported online at <http://esd.lbl.gov/Resources/Health&Safety/nearmissprogram.html>.

### **2.2 Responsibility and Accountability**

All ESD employees (including students, visitors, participating guests, contractors and matrixed employees) regardless of job classification, work location, seniority, or supervisory responsibilities, are to work under this Plan and are responsible for working safely. Furthermore, the Safety Line Managers (the Division Director, Department Heads and Supervisors, Principal Investigators (PIs)), Work Leads and Laboratory-space Lead PIs (LLPIs) have a special and unique responsibility to provide safety leadership. The Safety Line Management in ESD is detailed in a one-page handout called “ESD *Line Management @ a glance*,” which can be viewed at <http://esd.lbl.gov/resources/health&safety/atoz.html#a>. The “ESD *Line Management @ a glance*” is also posted in all ESD laboratories.

The ESD employee’s Supervisor (or host supervisor for guests and contractors) should be regarded as the *primary point of contact* for all safety concerns. The safety reporting structure and safety responsibilities of the ESD Safety Coordinator, Supervisors, Principal Investigators and Work Leads are further explained in Section 2.3 “Safety and Health Roles Responsibilities within ESD” of this Plan.

All ESD employees and contractors are responsible to stop work on activities considered to pose imminent danger, i.e., any condition or behavior that could reasonably be expected to cause death or serious injury, or environmental harm (<http://www.lbl.gov/ehs/refs/stopwork.shtml>). The employee should discuss the issue with their Supervisor, Work Lead, PI, Safety Coordinator, EHS Division Liaison or other member of the EHS Division staff and request assistance to resolve the issue before proceeding.

### **2.3 Safety and Health Roles and Responsibilities within ESD**

This section defines the specific roles and responsibilities for ISM implementation within ESD.

**The ESD Director** is responsible and accountable to the LBNL Director for assuring that demonstrable policies and programs are established and implemented to support and comply with the LBNL safety and health policies and requirements.

The ESD Director ensures that clear roles and responsibilities for compliance with all applicable safety and health policies are defined. The Division Director periodically reviews and approves revisions of this Plan, and shall hold all ESD staff accountable for understanding and complying with its provisions.



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The ESD Director ensures that the Division's research projects and unique activities are evaluated for potential hazards, and that safety controls are specified and implemented, approves Activity Hazard Documents (AHDs) for formally authorized work, ensures that no work is conducted in ESD under unsafe conditions and that all work conducted is performed in accordance with established controls.

The ESD Director shall ensure that all abnormal occurrences that could adversely affect the health and safety of employees, and the public, the environment, the intended purpose of LBNL facilities or the credibility of LBNL are timely reported. The ESD Director shall investigate the circumstances surrounding situations identified as imminent dangers, and assure that appropriate corrective actions and lessons learned are developed, implemented, and disseminated.

The ESD Director leads the discussions on relevant safety issues at Division Council meetings (composed of the Deputy Division Director, Department Heads, Program Heads, Business Manager, Safety Coordinator, and representatives from Human Resources) and ESD town hall meetings. Safety is be a permanent agenda item at these meetings and the Safety Coordinator is invited every month and participates when necessary The Division Director shall also maintain visibility and demonstrate line management commitment to safety and health by periodically walking through Division work space, as specified in the ESD Safety Walkthrough Policy (see Section 2.6 "ESD Employee Safety" of this Plan). The Division Director appoints the Safety Coordinator, and Safety Committee chair and members.

**The Department Heads** are responsible and accountable to the Division Director for understanding the LBNL and ESD safety and health policies and for understanding and complying with the provisions of this Plan. Department Heads, as part of Safety Line Management, are further responsible for assuring that this Plan is understood and is being implemented by their line managers (Principal Investigators, Supervisors), Work Leads and all personnel in their respective department.

Department Heads shall lead discussions on relevant safety issues at their respective Department meetings, with safety being one of the primary agenda items. They may also initiate other forms of communication within their Departments. Department Heads will lead at least two Safety Walkthroughs per year of ESD on-site spaces where people in their Department work, described in Section 2.6 "ESD Employee Safety" of this Plan. Department Heads designate one Lab-space Lead PI (LLPI) for each Technical Area in their Department. Department Heads, as part of Line Management, quarterly review the JHA and training completion of that ESD staff within their respective Department.

**The ESD Supervisors** (<http://esd.lbl.gov/about/staff/#ESDRoster>) are accountable to their Department Head for understanding and complying with the provisions of this Plan and for reviewing on-site and off-site research activities under their direction to identify and control work



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hazards, to consult appropriate subject-matter experts when needed, to prepare/review safety documents and authorizations, and to ensure that all work is carried out in a safe manner and in accordance with all Laboratory and Divisional safety and health requirements as set forth in this Plan. All supervisors shall complete the required supervisors' training (EHS0026 *ES&H for Supervisors, Managers, & Pls-Science Divisions* ), as identified in their training profile.

Each employee has one administrative ESD Supervisor who is responsible for the employee's professional development, mentoring, safety, and training. The Supervisor answers, or helps to find an answer to, the employee's safety and health questions, and is responsible for ensuring that the employee (1) is aware of work hazards and controls, (2) receives appropriate training, (3) works safely and within controls.

The ESD Supervisors are responsible for ensuring that the employees assigned to them (including participating guests, students and matrixed employees) have completed the Job Hazards Analysis (JHA), have taken all required training courses and necessary On the Job Trainings (OJTs), as described in Section 2.5 "Qualifications and Training" of this Plan, and are aware of ESD-specific safety and health requirements and resources. ESD Supervisors are responsible for their employees' safety even when they are not the PI or Work Lead of the project on which the employees work. In this case, the Supervisors shall share the responsibility with the PI.

The ESD Supervisors shall account for their supervisee's performance on safety and health issues when determining his/her overall job performance at the mid-year and annual performance reviews. The ESD Supervisors shall visit their supervisee's work areas semi-annually, at a minimum, as indicated in Section 2.6 "ESD Employee Safety" of this Plan.

The ESD Supervisors are part of the Incident Review Team of any ES&H occurrences involving their supervisees (see Section 2.6 "ESD Employee Safety" of this Plan), and they shall actively encourage their employees to report any safety and health issues/incidents/near-misses, and early onset of physical discomfort.

**Work Leads** (<http://esd.lbl.gov/about/staff/#ESDRoster>) are assigned by the Supervisors to assure that day-to-day work, operations, and activities are conducted safely and within established work authorizations. The Work Leads are responsible for ensuring that the employee is aware of work hazards and controls and receives appropriate training. All Work Leads shall be identified in the JHA database and complete the required Work Lead's training (EHS0033 *Safety Implementation Workshop for Work Leaders-Research Laboratory* or EHS0034 *Safety Implementation Workshop for Work Leaders-Office Environment*), as identified in their training profile.

**Supervisors of matrixed employees:** When an employee is matrixed from another division to ESD, the host and home Supervisors have complementary responsibility for the employee's safety training and safe work practice, as follows. It is the responsibility of the host Supervisor



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to see that matrixed employees have the appropriate training and knowledge to perform their work safely. The home Supervisor shall verify that the employee has received appropriate job-specific training from the host division, as well as the training requirements generated by the JHA process, as described in Section 2.5 “Qualifications and Training” of this Plan.

**Principal Investigators (PIs)** are accountable to their Department Head for understanding and complying with the provisions of this Plan and for reviewing on-site and off-site research activities under their direction to identify and control work hazards, to consult appropriate subject-matter experts when needed, to prepare/review safety documents and authorizations, and to ensure that all work is carried out in a safe manner and in accordance with all Laboratory and Divisional safety and health requirements as set forth in this Plan.

Within ESD, employees commonly work within a Project under the direction of a PI who is not the employee’s supervisor. In these cases, the PI and the supervisor have complementary responsibilities for the employee’s safety training and safe work practice, as follows. It is the responsibility of the PI to see that all staff working on the PI’s project have the appropriate on-the-job training and knowledge to perform the work safely. The PI shall advise the employee regarding hazards to enable effective completion of the JHA. The supervisor shall verify that the employee has received appropriate job-specific training by the PI, as well as the training requirements generated by the JHA process, as described in Section 2.5 “Qualifications and Training” of this Plan.

When an employee conducts part of his/her work away from his/her normal work environment, the appropriate on-site lab/facility manager, PI or the off-site safety manager designated in the particular ESD Off-Site Safety and Environmental Protection Plan (OSSEPP) (described in Section 2.4.c. “Off-site work” of this Plan) assumes safety and health responsibility for that employee in addition to the employee’s Supervisor. Work locations away from the normal work environment include: (1) an off-site field location, (2) one of the ESD Centers or Labs listed in Section 2.4, or (3) an on-site facility belonging to another Division.

**Lab-space Lead PI (LLPI)**—Many of the facilities/laboratories (i.e., Technical Areas) within ESD are shared by multiple PIs. Although the work performed by these PIs can be very different in its nature, for integrated safety management, a single PI is designated by the Department Head as the Lab-space Lead PI (LLPI) (<http://esd.lbl.gov/resources/health&safety/labsafety.html>). The LLPI is the Safety Area Lead (as defined in PUB3000) for a Technical Area, including laboratory spaces shared by several projects in one Program, or by more than one Program.

While all PIs are responsible for ensuring that their projects get the appropriate authorization and are conducted in a safe manner, the LLPI is empowered to resolve safety issues for the space and also coordinates shared safety and health laboratory functions. Examples include housekeeping,



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chemical inventory, waste management, and updating ES&H databases for all projects using that lab space.

The LLPI is ultimately responsible for resolution of all safety issues within the laboratory space, and maintaining a Lab Safety Primer (<http://esd.lbl.gov/resources/health&safety/primer.html>), which contains documentation of the hazards of that particular laboratory (see Section 2.6 “ESD Employee Safety” of this Plan). However, when a PI other than the LLPI is the sole user of a piece of equipment, that PI is responsible for ensuring that hazards associated with it are controlled and documented, in cooperation with the LLPI. Additionally, one person (e.g., a research associate or technician), who typically works in the laboratory full time, may be designated as the point of contact for that space; however, the LLPI (or PI solely responsible for a piece of equipment or an activity that requires special authorizations) is still ultimately responsible.

For work conducted in the Building 64 machine shop, the LLPI shall designate a shop manager who has experience in the safe operation and maintenance of machine and power tools. The shop manager shall monitor all shop work and (a) he/she shall determine whether other personnel are qualified to operate specific machine and power tools in the shop; (b) he/she shall determine who may use the shop machine and power tools, and how and when they may do so; and (c) he/she shall ensure that only qualified and authorized personnel operate the shop machine and power tools. Safety glasses are required at all times work is performed in the shop.

It is LBNL policy to safely operate and maintain machine tools, power tools, and machine equipment in shops. The LLPI or Work Lead shall provide machine guarding and ensure that it is being used to protect operators, and other employees from hazards. The LLPI or Work Lead shall permit only personnel who have been explicitly approved by the shop manager and are authorized to operate the equipment to work in the shop.

Machine tools, machine equipment, and power tools should be routinely inspected to verify that they are not damaged, that the controls function as designed, and that all guarding and shields are securely installed and adjustable. Only qualified technicians or qualified vendors are permitted to service equipment. The equipment shall be serviced only when all electrical, hydraulic, compressed air, and stored energy sources are secured in accordance with the requirements of applicable Lockout/Tagout procedures, per PUB-3000, Chapter 18.

The **ESD employees** (including students, participating guests, employees matrixed to ESD from other Divisions) are responsible for understanding and complying with the provisions of this Plan, and for knowing and following the safety and health requirements that apply to their work. They are expected to comply with the Division’s safety and health requirements and identify, understand, and be trained to deal with the hazards associated with their work, to work safely, to report all significant adverse ES&H events and conditions (i.e., injuries, accidents, fires, contact with electricity, environmental releases and other safety violations), incidents, near-misses and



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onset of physical discomfort to their supervisors. If appropriate formal reporting and tracking is done by the EHS Division using DOE's Occurrence Reporting and Processing System (ORPS). The ESD employees and contractors are expected to comply with Job Hazards Analysis (JHA) and training requirements described in Section 2.5 "Qualifications and Training" of this Plan.

The **ESD Subcontractors, Vendors and Guests** are responsible for knowing and following the safety and health requirements that apply to their work. ESD PIs and Work Leads are responsible for the safety of non-construction work by assuring that qualified service suppliers are selected, hazards are identified and controlled, work is authorized, and on-site work is performed safely in compliance with LBNL ESH requirements.

Onsite Hands-On Work (PUB 3000, Chapter 31, Appendix D) performed by Subcontractors or Vendors, must be authorized. If the Subcontractor or Vendor has performed similar work at LBNL and has an existing work authorization, the ESD PI or Work Lead requesting the work must review the existing authorization and verify that it covers the requested work.

The Requestor (the individual requisitioning the work to occur) should work with the Division Safety Coordinator and other Subject Matter Experts prior to finalizing the award of the subcontract. Prior to starting work, the Requestor works with the Subcontractor, Vendor, or Guest to:

- Jointly review the SJHA form and ensure that all work hazards and controls are identified;
- Identify any additional requirements that require Subject Matter Experts approvals or Safe Work Authorizations (e.g. activity hazard document, radiological work authorizations, penetration permit, etc.), especially for high-hazard level work. Electrical Work requires completion of additional safety work authorizations/documents;
- Conduct pre-job meetings and review the EH&S orientations and work authorizations
- Ensure that GERT training or other required training is completed
- Sign the SJHA to enact the Work Authorization and therefore enable the work to start

The ESD Requester should provide oversight and keep records of their visits to the work site and observations. Low-level hazard work (not requiring formal authorization) oversight is comparable to the oversight of similar activities performed by LBNL employees. High-level hazard work (requiring formal authorization) must be checked at a minimum frequency of once per workday, or more frequently if required by work authorizations.

Upon completion of the work the Requestor or, when necessary, a designee who is knowledgeable of the activity and has observed the work at a frequency that is commensurate with the hazard level shall:

- Complete the "Record of Oversight for Scope of Work" section of the SJHAWA
- Forward the final signed copy of the SJHAWA to the Division Safety Coordinator to maintain a copy for the Records file.



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Work that is not performed in conformance with the authorization should be corrected on the spot. Significant or multiple non-conformances may be cause for dismissal of the contractor, vendor and should be brought to the attention of the EHS Division Non-Construction Safety Assurance Program Manager and appropriate Procurement personnel.

The SJHA process is further outlined in greater detail by the EH&S Division's Guidelines and Instructions and is summarized in the ESD SJHA At-A-Glance (<http://esd.lbl.gov/Resources/Health&Safety/sjha.html>).

**Construction work** must be authorized by LBNL Facilities. The safety and health of construction subcontractor employees is the responsibility of the construction subcontractor (PUB-3000, Chapter 10). ESD personnel should stop all work that poses imminent hazards on construction projects.. Other safety concerns at construction sites should be brought to the attention of the Facilities Project or Construction Manager, or an EHS Division Construction Safety subject matter expert.

**ESD Building Manager and Building Emergency Team members** are helping ensure efficient and effective management of ESD facilities. An ESD Building Manager is assigned for buildings 70 and 70A and 14 by the division director. The Building Manager is required to work with the LBNL emergency preparedness team and the employee volunteer Building Emergency Team (BET) and coordinate building evacuations and re-entry, control assembly areas, assist search and rescue procedures under supervision of professional responders, communicate with the Emergency Operations Center and maintain and control emergency equipment. Additionally, the Building Manager is informed of and coordinates construction and maintenance projects with the building occupants and serves as a point of contact for general information about the building activities and occupants.

The roles and responsibilities of Building Managers and Assistant Building Managers are detailed in the *Building Management Policy and Procedures* and they are required to complete the following training: EHS0156 *Building Manager Orientation*.

Roles and responsibilities for Building Emergency Team leaders and team members are detailed in the *Site-wide Building Emergency Plan* and they should complete the following training: EHS0116 *First Aid Safety*, EHS0530 *Fire Extinguisher Safety*, EHS0154 *Building Emergency Team*; EHS0123, *Adult CPR* (recommended); EHS0135, *Earthquake/Wildland Fire Safety* (recommended); EHS0155 *Building Emergency Team Seminars*(recommended).

**The ESD Safety Coordinator** is appointed by the Division Director, and is responsible and accountable to the Division Director for advising, documenting, disseminating, and tracking compliance with ESD safety and health policies. The Safety Coordinator serves as a point of contact between ESD staff (including matrixed employees, students and participating guests) and LBNL's EHS Division. The Safety Coordinator's roles and responsibilities are defined in Pub-



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3000, Section 1.3.2.9 (<http://www.lbl.gov/ehs/pub3000/CH01.html#sec1329>) and they are summarized below.

The Safety Coordinator shall promote the communication of safety and health issues throughout the Division by updating the ESD ES&H website, distributing ESD-level 1 emails and preparing quarterly safety reports to the ESD Management. The quarterly safety report shall include CATS statistics, SAA compliance statistics, a training summary, status of AHDs, Self-Assessment status, injury reports, reportable occurrences (ORPS), and special problems. Additional reports will be provided, upon request, to persons and offices of outside organizations with and for whom ESD conducts research.

The Safety Coordinator shall participate in the Safety Agenda Item discussions of Division Council meetings once a month, or as needed. The Safety Coordinator shall participate in health and safety assessments, including the ESD safety walkthroughs, quarterly formal inspections of all ESD SAAs, Management Environmental Safety and Health (MESH) reviews, and other additional safety surveillances at the request of the ESD Director.

The Safety Coordinator shall review all Safety Review Questionnaires (SRQ), all corrective action plans (CATS) developed by the PI (and/or responsible staff) for any research facility or operation for which safety issues persist, and the AHDs in conjunction with the PI and the ESD Director. The Safety Coordinator shall support supervisors in performing team-investigations of ES&H incidents.

The Safety Coordinator shall review this Plan annually and revise as needed and provide an annual Self-Assessment Report to the Office of Contract Assurance, through the ESD Director.

The Safety Coordinator should complete the following training: EHS0032 *Incident Review Processes and Procedures*, EHS0027 *Effective Safety Walkaround Training*; EHS0799 *EH&S Self-Assessment Training*, EHS0802 *ORPS Reporting*; EHS0059 *Remedy Interactive Ergonomic Self Assessment* (recommended), EHS0061 *Ergonomic Advocate Training* (recommended); EHS0348 *Chemical Hygiene and Safety Training* (recommended); and EHS0604 *Hazardous Waste Generator Training* (recommended).

**The ESD Safety Committee** will monitor the implementation of the ESD safety and health program, identify opportunities for improvement, advise the Division Director on safety and health issues, facilitate communication of safety and health issues throughout the Division, and support self-assessment activities. Should any need for changes arise in the Division's implementation of integrated safety management, the Committee will discuss the matter and make recommendations to the Division Director (<http://esd.lbl.gov/resources/health&safety/committee.html>). Each meeting will begin with a resolution-oriented discussion of the most critical current divisional safety issues, followed by a report from the Safety Review Committee. The Committee



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will generally meet on a monthly basis, but at least six times per year. A quorum of three committee members is required for a meeting. The Division Director will periodically review committee members' participation.

The **ESD Safety Committee members** are appointed by the ESD Director and consist of the Safety Coordinator, Department Heads, at least one representative from each Department to cover all types of work performed within the ESD Departments, the ESD representative to LBNL's Safety Advisory Committee, and the EHS Division Liaison to ESD; appointments are usually for a three-year term. The Division Director will participate on an *ex officio* basis. An ESD staff, appointed by the Division Director, will chair the ESD Safety Committee and will organize meetings, set agendas, and record and publish meeting minutes, which will be distributed to the ESD Management, Safety Committee Members, and posted on the ESD ES&H website.

The **ESD Safety Committee members** are expected to:

- monitor the implementation of the ESD safety and health program,
- identify opportunities for improvement,
- advise the Division Director on safety and health issues,
- facilitate communication of safety and health issues throughout the Division, and
- support self-assessment activities.

The **Safety Advisory Committee (SAC)** advises the EHS Division Director on the development and implementation of Environment, Safety, and Health policy, guidelines, codes, and regulatory interpretation. SAC conducts reviews of special safety problems, and provides recommendations for possible solutions to the LBNL management. SAC also schedules and conduct Management of Environment, Safety, and Health (MESH) reviews.

The LBNL Director appoints the SAC Chair and SAC membership includes a representative from every Laboratory division. The Division Directors nominate members of their organizations to the LBNL Director, who formally appoints them to the SAC. Appointments are normally three-year renewable terms.

The **SAC members** are expected to:

- possess an understanding of ISM.
- communicate regularly with senior division management and other division personnel as needed.
- possess communication skills to comment on, make suggestions or recommendations for, revise, advise senior management on, and influence the Laboratory's approaches, methods, documents, and practices to continuously improve the Laboratory's safety programs.
- develop an understanding of the LBNL Health and Safety Manual (PUB-3000) and related documents, and the processes for revising these documents.



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### 2.4 Scope of Work Authorized

#### a. General

ESD employees develop tools and knowledge that enhance understanding of the Earth. They perform three types of research work: (1) theoretical and computational studies in offices, (2) analytical measurements, instrument development, and bench-top physical modeling in wet labs and instrument shops, and (3) experiment installation and geoscience data acquisition at various off-site (also called *field*) locations.

Each Department within ESD performs bench-top research and tool development in laboratories located in on-site Buildings 14, 64, 51F, 70, and 70A. Offices are also located in these buildings, with the majority of office space located in Building 90. Most field work is staged in Building 64, which includes a machine shop. Some smaller field projects are staged in Buildings 14, 70 and 70A. Links to descriptions of ESD facilities can be found at <http://esd.lbl.gov/research/facilities/>.

Off-site work is conducted at various user facilities and sites owned and managed by federal, state, and private organizations, including the UC Berkeley Campus and the Richmond Field Station. Some research is performed on ocean vessels

#### b. Work Requiring Safety Review and Approval

The PIs and Work Leads shall ensure that all work is conducted within appropriate levels of Job Hazards Analysis work authorizations and other formal authorizations. The PIs and Work Leads will review the authorization documentation at least annually and update any personnel assignments, work-scope and experimental procedures. They notify supervisors of any changes to personnel assignments.

In order to identify and allocate the appropriate resources and budget for ES&H support for new projects, the ESD PIs complete a Project/Facility Safety Review Questionnaire (SRQ) (<http://esd.lbl.gov/resources/health&safety/atoz.html#s>) at the time of Field Work Proposal (FWP) or proposal submission. Each SRQ is reviewed by the Safety Coordinator, who may consult with EHS Division Subject Matter Experts for advice on whether the project would require safety documentation and EHS Division approval for special hazards as defined in Pub 3000, Chapter 6 (<http://ehswprod.lbl.gov/AHD/start.aspx>).

When a new project is awarded, the PI, LLPI or Work Lead shall evaluate the work and associated hazards and depending on the hazards. For special hazards, the PI, LLPI or Work Lead shall document the work and associated hazards, describe administrative and engineering controls to mitigate those hazards, and document training for the staff in a formal authorization, approved by the Division Director (or designee) with EHS Division review and concurrence. ESD work is



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controlled by a number of formal authorizations including Radiological Work Authorizations (RWA), Activity Hazard Documents (AHD), research involving human or animal subjects, and other biological work [Biological Use Authorization (BUA), or Biological Use Notification (BUN)] or Electrical Safety and Lockout/Tagout & Verification. Off-site work is identified and the need for a new or revised Off-Site Safety and Environmental Protection Plan (OSSEPP) (specific to ESD and described in the next sub-section) is evaluated.

Whenever a change in laboratory work-scope occurs that may require new or additional safety review and approval, PIs and Work Leads are responsible for reporting the change to the LLPI and acquiring the necessary authorizations.

### c. Off-site Work

An Off-site Safety and Environmental Protection Plan (OSSEPP) is required for all off-site research activities, except for observer's visits, work at DOE user-facilities, at UCB and its facilities at the Richmond Field Station, and at other academic institutions (<http://esd.lbl.gov/resources/health&safety/ossepp.html>). The OSSEPP is intended to document site-specific and work-specific hazard analysis, to inform employees of the hazards present, to identify the training and protective measures needed to perform work safely, to provide emergency information and to serve as a safety training document. The PI or Work Lead of each off-site project is responsible for preparing an OSSEPP in accordance with ESD procedures and the health and safety rules, training requirements and other guidelines established at each off-site facility.

The OSSEPP is approved by the PI or Work Lead and Safety Coordinator; ESH Division Subject Matter Experts will be consulted as needed. OSSEPPs shall be kept on file in the ESD Office, and will also be posted or readily available at the work site; electronic copies are kept by the PI and Safety Coordinator. The PIs will review their OSSEPPs annually and before each field trip and update them whenever there is a change in scope of work, staffing or hazards. The review will be documented either as a revision or a memo to file if no changes are required. A list the active ESD OSSEPPs can be found at the ESD webpage ([http://esd.lbl.gov/resources/health&safety/ossepps\\_active.html](http://esd.lbl.gov/resources/health&safety/ossepps_active.html) )

The PI or Work Lead shall ensure that all staff assigned to an off-site research project have read and signed the approved OSSEPP before travel. Staff shall inform their supervisors of their off-site work activity, and discuss safety issues as appropriate.

ESD staff should notify their supervisor and Health Services for all off-site, work-related injuries. For off-site accidents involving a government vehicle, ESD staff should notify the local police authority, complete an LBNL motor vehicle accident report, and submit it to the motor pool at <http://isswprod.lbl.gov/AccidentReport/>. For vehicle accidents involving a rental car or personal



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vehicle on official business, ESD staff should notify the local police authority, and complete the forms required by the rental company or by the insurance company. Copies of all reports should be submitted to the LBNL Counsel.

### d. Work on the UC Berkeley Campus

Work carried out by ESD employees on the UC Berkeley Campus in spaces under the control of UC Berkeley will be carried out in accordance with the “*Partnership Agreement Between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures*” ([http://www.lbl.gov/ehs/ism/ucb\\_lbl\\_partnership\\_3\\_15\\_04.pdf](http://www.lbl.gov/ehs/ism/ucb_lbl_partnership_3_15_04.pdf)), dated March 15, 2004, as provided in the LBNL Institutional ISM Plan:

- LBNL PIs have an obligation to the LBNL management to provide a safe workplace on campus for all LBNL sponsored work. At UCB, this is satisfied by complying with the UCB Safety System.
- LBNL PIs are responsible for analyzing work of persons under their direction and for assuring that the proper training for safe conduct of work is identified and obtained. Until an individual has been properly trained, he or she will work under the direct supervision of someone who is trained. The type and method of training for work performed at UCB is specified by UC Berkeley.
- LBNL PIs conducting Berkeley Lab-sponsored work are free to implement controls and other measures in addition to the institutional requirements if they deem it appropriate.
- LBNL PIs working at UCB can request a joint safety assessment (to be conducted by representatives of both the UCB EH&S and LBNL’s EHS Division) to further aid them in ensuring a safe workplace.

LBNL PIs conducting LBNL sponsored work at UCB will comply with all UCB assurance requirements that they have met UCB standards including properly specifying training requirements (for themselves, employees and students), obtaining and adhering to UCB work authorizations, and meeting UCB self-inspection requirements.

## **2.5 Qualifications and Training**

*Guiding Principle: All ESD employees, students, contractors, and participating guests shall have the necessary work authorization, technical skills, knowledge, training, personal protective equipment, and certifications required by law and by Laboratory policy to perform their duties safely and in a manner protective of the Laboratory’s assets and the environment.*

All new employees, matrixed employees, participating guests, students, visitors, and contractors must receive basic safety and health orientation information prior to commencing work at LBNL. At the onset of employment, all employees must receive clear information of the ESD Management expectations. They will meet with the ESD Safety Coordinator for an overview of LBNL’s and ESD’s health and safety requirements. All new employees working in a lab will meet with



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the LLPI to discuss and understand the hazards associated with the lab activities. Guidelines for new employees and a new employee checklist can be found at the ESD web: [http://www-esd.lbl.gov/workplace\\_resources/new\\_employee/files/empchecklist.html](http://www-esd.lbl.gov/workplace_resources/new_employee/files/empchecklist.html).

All employees must complete the Job Hazards Analysis (JHA) (<http://www.lbl.gov/ehs/jha/>) and have their work authorized. The JHA process provides a description of the work hazards and controls (called the Hazards Profile) and a Work Authorization. The JHA contains a description of the work, the tasks incorporated into that work, the hazards associated with those tasks, and the controls required to mitigate those hazards. Signatures by the Work Lead and the employee indicate that a JHA review was completed and that there is an understanding of safety requirements of the work involved; a completed JHA authorizes work to start. It is advisable for new employees to complete the JHA with their Work Lead or Supervisor, in order to ensure that the employees understand their tasks and related hazards. The JHA should be completed within 30 calendar days of employment.

The output of the JHA process is a list of required and recommended safety training courses. Each employee's Work Lead will ensure the required ESD and LBNL training is completed within 30 days of the JHA approval (exceptions are for courses that are offered less frequently). The ESD Orientation for New Staff should also be completed within that period. Depending on the job requirements, the Work Lead may specify additional training, such as off-site courses and on-the-job training. ESD employees are responsible for completing required training within the required timeframe, and for updating the JHA annually or more frequently when a change in job duties occurs and completing additional training. If an employee has not completed required training, he/she must work under the direct supervision (line-of-sight) of a trained individual. General Employee Radiological Training (GERT) is required for all staff (including guests and subcontractors); access to LBNL will be denied to all staff with incomplete or expired GERT.

The employee's Work Lead is responsible for ensuring that the employee's training status is reviewed as part of the mid-year and annual performance review process. Each employee's safety performance will be measured against the requirements of this Plan during his/her performance review.

The PI and/or LLPI are responsible for task/hazard-specific, or on-the-job training that is not covered in JHA generated training requirements for anyone working on the PI's project. The PI and/or LLPI will discuss any specific training requirements with the employee's Work Lead. The Work Lead shall ensure that the employee is aware of the task/hazard-specific, or on-the-job training and verify that the employee has received the required specialized training. The lab task/hazard-specific training shall be documented in "Lab Safety Primers" (see Section 2.6, "[ESD employee Safety](#)"). Machine shop users are authorized by the machine shop manager, and the authorization will be documented in the Building 64 "Lab Safety Primer."



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Employees who are assigned to off-site project work may be exposed to additional site-specific, natural and man-made hazards. The PI of the field project shall ensure that these employees are informed of any new hazards as well as any additional controls and training required for protection and safety. This shall be documented in the OSSEPP developed for that project (see Section 2.4 c. “Off-site Work”). The PI shall also ensure employees take additional training required by the host site as documented in the OSSEPP. The employee shall notify his/her Work Lead of participation in off-site work, and discuss the hazards, controls and required training.

For participating guests conducting ESD field or laboratory research, the type of safety training will be determined by the host PI and/or Work Lead upon completion of their JHA. Until they have received required training, participating guests must work under line-of-sight supervision of a trained individual.

ESD Sub-contractors (<http://esd.lbl.gov/Resources/Health&Safety/sjha.html>) performing hands-on work at LBNL shall complete the Subcontractor Job-Hazard Analysis and Work Authorization (SJHAWA), EH&S Orientation for Subcontractors, Vendors and Guests, and GERT (<http://www.lbl.gov/ehs/ssa/nssa/index.shtml>). Additional electrical work authorizations and permits may be required and shall be obtained before the work commences. A SJHAWA is specific to the individual subcontractor performing the work, the work scope and the location and will be reviewed and re-authorized annually.

### 2.6 ESD Employee Safety

*Guiding Principle: Supervisors will provide employees with a safe workplace and will ensure that work is performed within the authorized controls.*

#### a. Line Management Responsibility

Line Managers shall ensure that workplace hazards are identified, evaluated, and controlled, and that employees are provided with and use the appropriate safety controls, including personal protective equipment per PUB-3000 Chapter 19 ( <http://www.lbl.gov/ehs/pub3000/CH19.html>), and LBNL’s Chemical Hygiene and Safety Plan (<http://www.lbl.gov/ehs/chsp/index.shtml>), and ergonomically appropriate furnishings and equipment. Line managers shall also hold each employee accountable for safety, and shall recognize ES&H contributions via the performance review process. Line managers are encouraged to use SPOT awards for safety to recognize employees that have made significant contributions to the ESD safety and health program.

#### b. Safety Walkthroughs

Safety walkthroughs are performed to observe work, inspect the workplace, and talk with the employees about the safe performance of work. The walkthroughs serve the purpose of proac-



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tive accident prevention and promotion of safety and health awareness among staff members and demonstrate the importance that Line Management attaches to safety.

Table 1 specifies the ESD safety walkthrough requirements. The Division Director and/or Deputy Director will inspect all ESD space (labs, shops and offices) at least once per year, using the EH&S Safety Checklists for Managers, or similar (<http://esd.lbl.gov/Resources/Health&Safety/Safetywalkthrough.html>), which provide guidelines for the different types of spaces they are responsible for (general work area, lab and shop). The walkthrough results are reported to the Department Heads who are responsible for follow-up.

ESD Department Heads shall conduct bi-annual safety walkthroughs of laboratory and office areas under their jurisdiction (see Table 1) to identify and correct safety and health deficiencies. Prior to the Department Head's walkthrough, the LLPIs will remind all lab personnel to update the Chemical Management System (CMS) and Hazard Management System (HMS) databases.

Each employee completes the “*ESD Inspection Checklist*” (<http://esd.lbl.gov/Resources/Health&Safety/Safetywalkthrough.html>) for their work area (only one checklist is needed for each laboratory space). The checklists are reviewed and collected at the time of the walkthrough for necessary follow-up. The Department Heads and Safety Coordinator will document the results and follow-up as needed.

The LLPIs shall conduct monthly inspections of the laboratory space for which they are responsible. These inspections are conducted using the “*ESD Inspection Checklist*” or the lab's own checklists approved by the Safety Coordinator. The dates and the results of the inspections are documented on the “*ESD Log for Safety Walkthroughs of Lab/Shop Space*” (<http://esd.lbl.gov/Resources/Health&Safety/Safetywalkthrough.html>) which is kept in the lab safety primer or posted near the main lab entrance. The completed “*ESD Log for Safety Walkthroughs of Lab/Shop Space*” shall be reviewed by the Safety Coordinator periodically.



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Table 1. ESD safety walkthrough requirements

Title	Who	Minimum Frequency	Purpose	Documentation
Division Director Walkthrough	Division / Deputy Director, Safety Coordinator, EH&S Liaison, Business Manager	1x/yr	Promote safety culture, management awareness of safety/space issues, ensure effective self-inspection of work areas.	Management checklist (EH&S)
Department Head Walkthrough	Department Head, Safety Coordinator	2x/yr (off-trimester from DD walkthrough)	Promote safety culture, knowledge of workplace ES&H issues, review new projects, equipment and hazards, ensure effective self-inspection of work areas [collect checklists, discuss required CMS and HMS updates)	ESD Inspection Checklist
Lab-space Lead PI (LLPI) inspections	LLPI, lab contact	Monthly	Maintain safety and health standards in labs, review new projects/equipment/hazards/OJT records	ESD Log for Safety Walkthroughs of Lab/Shop Space

In order to conduct effective safety walkthroughs, the Division/Deputy Director, Department Heads and LLPIs shall complete EHS0027, *Performing an Effective Safety Walkaround training*.

Supervisors will visit their employees' work area(s) at least twice a year to promote Supervisor awareness of employees' work conditions, allow communication of safety and health concerns, with a special focus on ergonomics.

Issues identified during walkthroughs that require follow-up and/or tracking must be documented in CATS, either by the PI or the Safety Coordinator. "Risk Levels" are assigned to each finding, according to the definitions in the *CATS User Manual* (accessible from the CATS database, <https://isswprod.lbl.gov/cats/login.aspx>). The Manual also lists the time requirements for closing and validating findings based on a graded approach as determined by Risk Level. To ensure the implementation of corrective actions, follow-up inspections will be conducted by the responsible Department Head and/or Safety Coordinator, in a time frame consistent with the finding. In addition to safety walkthroughs, any safety deficiencies noted at any time by the ESD management or Safety Coordinator shall be entered into CATS and corrected according to Risk Level.

### c. Lab Safety Primer

Each ESD Lab-space Lead PI (defined in Section 2.3 "Safety and Health Roles and Responsibilities within ESD") will maintain a Lab Safety Primer (<http://esd.lbl.gov/resources/health&safety/primer.html>) that provides access to information needed to work safely in a specific laboratory space. This manual will include copies of all relevant work authorizations and documentation of on-the-job training for the work performed in the space. Lab Safety Primer should periodically be reviewed and updated in order to ensure that the



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information therein is current. Each person working in a laboratory must familiarize him/herself with the location of the safety manual, read it before starting the work and document completion of this action in an email to the LLPI and/or signs a form included in the Primer. The LLPI updates the manual annually or whenever the scope of work changes, or new work authorizations are approved. The LLPI notifies the employees of these changes.

### d. Incident Investigation

All accidents that occur within ESD shall be thoroughly investigated to prevent recurrence. For cases that involve an injury, the Safety Coordinator will assist the Supervisor to form an incident review team, which includes the affected or injured employee, the employee's supervisor, the Safety Coordinator, and the EHS Division Liaison. Review of OSHA-recordable accidents would require a root-cause analysis performed by a trained professional who will be included in the review team.

The results of the incident review will be recorded on the LBNL Supervisor's Accident Analysis Report (SAAR). While the review of such incidents is a team responsibility, completion of the electronic SAAR is the responsibility of the supervisor and it must be completed and submitted within 7 calendar days of the time that ESD received notice of the incident. The report may be modified later if additional information is obtained.

The Safety Coordinator initiates reviews for first aid and OSHA recordable injuries, supports the Supervisor and facilitates interviews, works with the Supervisor to complete the SAAR and submit corrective actions into CATS, reviews and approves the SAAR after the Supervisor drafts it, works with Team to complete the Investigator's Report and when first aid reviews require more expertise, contacts the EHS Division Incident Review Program Manager.

All safety and health incidents will be discussed by the Safety Committee and Lessons Learned will be developed, as appropriate. The Department Head is notified of any ES&H incidents, and the Division Director is notified of all OSHA-recordable accidents.

### e. Medical Surveillance

The Medical Surveillance Program is administered by Health Services and conducted in accordance with the LBNL Health Service Program policies (PUB-3000, Chapter 3; "Health Services [http://www.lbl.gov/ehs/pub3000/CH03.html#\\_Toc407014430](http://www.lbl.gov/ehs/pub3000/CH03.html#_Toc407014430)). The Medical Surveillance Program provides medical examinations and laboratory evaluations to monitor and protect employees who may be at risk from health hazards at work. Medical consultations and examinations related to employee exposure are provided to any employee exposed at or above an Action Level (or in the absence of an established AL, one-half the lower of the OSHA PEL or the ACGIH TLV); when an employee develops a sign or symptom of exposure to a hazardous material; or



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when an uncontrolled event such as a spill, leak, or explosion takes place in which there is a likelihood of employee exposure. Anyone with a concern or question may request a medical consultation. Health Services should also be consulted by women who are either pregnant or intend on becoming pregnant.

ESD employees who may benefit from more frequent or additional voluntary medical examinations and laboratory evaluations include the following:

- Geotechnical support staff
- HAZMAT Response Team
- Laser users
- Staff exposed to excessive noise levels
- Staff who work with blood, blood products, or human cell lines
- Staff who work with radioactive isotopes, x-ray devices, or accelerators
- Staff exposed to excessive levels of airborne dust gases and vapors.

### f. Ergonomic Safety

To promote ergonomic awareness and prevent injuries from occurring, Work Leads must ensure that employees take necessary training and have the ergonomics safety of their work place (office, lab, and field) evaluated. Particularly for performing computer-intensive work (work on average 4 or more hours per day on the computer), employees must take EHS0059-*Ergo Self-assessment for Computer User*, and have an ergonomic evaluation of their workstation (lab and office).

The completion of EHS0059 creates awareness of the employee's problem postures and behaviors, imparts ergonomics principles and techniques to avoid musculoskeletal problems, encourages employees to make hardware adjustments/ modify behaviors to self-correct, and identifies individuals at "High" and "Moderate" risk and direct them to ergonomics resources to help lower their risk. An annual re-evaluation (EHS0058 *Ergo Self-assessment Refresher*) is also required.

Additionally, ergonomic evaluations should be performed when employees move to a new location, anticipate a change in work assignments/load and/or experience the earliest signs of discomfort. Work groups with non-computer ergonomics concerns (e.g., work in a laboratory settings, and unusual material handling) may request EHS Division to provide ergonomics training focused on such areas.

The employee works with their Work Lead and/or PI to implement the evaluator's recommendations, including the purchase of recommended equipment, furnishings, or their modifications. It is ESD policy that all staff, including telecommuters, shall obtain the necessary ergonomic equipment/furnishings/accessories. These are paid for by project funds; assistance from the Division is available if project funds are lacking.



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### ESD Ergo-advocates

The Division Director assigns ESD staff to serve as ergo-advocates. The ergo-advocates are a resource to employees, Work Leads, and Safety Coordinator for ergonomic-related inquiries and they work with the Safety Coordinator to identify and monitor employees at risk for ergonomic injury.

The ergo-advocates receive special training (EHS 61 *Ergonomics Evaluator Training*) and perform preventive (non-pain-motivated) ergonomic evaluations. They reinforce good work practices to reduce at-risk behaviors, review the results of employee self-evaluations, and follow up on all computer users assessed at moderate risk, enters ergonomics evaluation results into the on-line Ergonomics Database in a timely manner and monitors the implementation and effectiveness of corrective actions. The ergo-advocate refers evaluations involving employee discomfort or complex situations to EHS Division ergonomists,

### Ergonomic Support Services for Off-Site/Remote Computer Users

ESD Employees using a computer either at a remote location or telecommuting 20 or more hours per week should take Web-based Remedy Interactive self-evaluation & training (EHS0059). Upon training completion, the employees working off-site should contact EHS Division ergonomist to discuss any ergonomics concerns and implement appropriate solutions.

## **2.7 Environmental Protection and Waste Management**

*Guiding Principle: ESD will conduct activities in a manner that protects the environment while complying with applicable air quality, water quality, and hazardous waste requirements, including appropriate efforts to prevent pollution and to minimize wastes produced.*

### a. Hazardous Waste Management:

All hazardous waste generated shall be appropriately and accurately labeled, contained, and disposed of in accordance with LBNL and California State regulations. All waste that is ignitable, toxic, corrosive and/or reactive is deemed chemically hazardous and shall be kept in a Satellite Accumulation Area (SAA). Waste containing nano-material (<100nm) shall be placed in a double bag and identified as “nano-material” on the label. Waste that is radioactive or a mixture of chemically hazardous and radioactive waste shall be kept in a Mixed Waste Accumulation Area (MWAA). The Safety Coordinator will keep a list of all SAAs and MWAA's and their Custodians within ESD, and must be notified before an accumulation area is established or removed. ESD does not maintain any Waste Accumulation Areas (for larger volumes of waste than allowed in an SAA).



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The SAA Custodian is responsible for ensuring that all waste added to the SAA or MWAA is accurately labeled, characterized and picked up in a timely fashion (no more than six months following the start of waste accumulation). The LLPI is responsible for knowing about the existence of SAAs in their lab space, ensuring that the SAA is in compliance with EHS Division Waste Management requirements and evaluating compliance during the monthly LLPI walkthrough.

No ESD employee shall establish, or add wastes to, an SAA or MWAA without having taken the required LBNL/EHS training and without the knowledge and approval of the SAA Custodian. All employees who generate waste shall separate waste streams to minimize the burden of waste disposal (for example, by keeping chlorinated and non-chlorinated solvents separate, and keeping radioactive and chemically-hazardous wastes separate).

Working with the Safety Coordinator, the EHS Division Waste Management Generator Assistant is responsible for scheduling, conducting, and disseminating results of quarterly inspections of all SAAs, and for helping ESD staff to improve waste management, to reduce the amount of hazardous and mixed waste generated, and to seek on-site treatment strategies. The findings of SAA inspections will be communicated to the designated custodians, LLPIs, the ESD Director and Department Heads. Corrective actions will be implemented according to the hazard level of the finding, but no longer than 60 days, and verified by the Safety Coordinator at the next quarterly inspection.

### b. Waste Minimization

ESD is committed to waste minimization and resource conservation, seeking opportunities to reduce the use of paper, use recycled materials and minimize waste generation. Staff are encouraged to turn off their equipment and computers/monitors when not in use, turn off screen savers; when they are on, the computer is on and purchase energy efficient equipment (Energy Star rated) whenever possible.

Based upon responses to the Safety Review Questionnaire, the Safety Coordinator will follow-up with PIs to evaluate opportunities for waste minimization for new projects. Laboratory and business practices are periodically reviewed for new opportunities for waste minimization [Salvage\_&\_E-Waste\_Management\_@aglance, (<http://esd.lbl.gov/resources/health&safety/atoz.html#w>)]. The LLPIs or Work Leads will discuss with the lab staff the need to minimize chemical use or use chemicals with lower toxicity levels, methods for waste minimization and pollution prevention at the monthly LLPI walkthrough.



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### **2.8 Balanced Priorities**

*Guiding Principle: ESD management and ESD Principal Investigators will allocate an appropriate amount of resources to ES&H requirements.*

PIs will factor into their budget plans the costs of safety equipment, employee training, permits, proper chemical storage and inventorying, waste disposal, pollution prevention, environmental protection, ergonomic furniture/accessories, project relocation and decommissioning, and facility modifications, unless the latter are covered by institutional funding sources. For new projects, the SRQ form is used to identify and help budget the ES&H costs.

To facilitate implementation and execution of the ESD safety and health program, the following Divisional resources are made available:

0.75 FTE for	ESD Safety Coordinator
0.25 FTE for	ESD ERGO Advocates
0.10 FTE for	ESD Administrative Support.

In addition, the EHS Division will provide 0.46 FTE on a matrix basis to assist the ESD Safety Coordinator and ESD staff. Resources to be committed include approximately 0.15 FTE for the EHS Division Liaison, and the remainder allocated to Industrial Hygiene and Health Services, Occupational Safety, Fire Protection, Emergency Preparedness, Radiation Protection, Environmental Protection, and Waste Management ([http://www.lbl.gov/ehs/assets/division\\_help\\_print.pdf](http://www.lbl.gov/ehs/assets/division_help_print.pdf))



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### 3. APPROVALS

Prepared by:

Vivi Fissekidou  
ESD Safety Coordinator

10/27/09

Date

Approved by:

Don DePaolo  
ESD Director

10/27/09

Date

EHS Division Resource Commitment:

N/A

Howard Hatayama  
EHS Division Director

Date

Accepted:

N/A

LBNL Director

Date



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### ATTACHMENT I

#### List of Controlled ESD Documents

ESD Documents that implement safety and health requirements shall be controlled. Work shall be conducted using the latest revision of these documents. The controlled documents shall have a unique identifying number (including revision number), title, and a revision history to summarize changes to these documents. The controlled documents shall be reviewed annually and revised as appropriate; if no changes are required the review will be documented in a memo to file.

The ESD safety and health documents are:

- ESD ISM Plan (ESD-ISM-1.0 Revision 9)
- Active OSSEPPs ([http://www-esd.lbl.gov/ESDEHS/ossep\\_forms/ossep\\_active.html](http://www-esd.lbl.gov/ESDEHS/ossep_forms/ossep_active.html))
- Laboratory Procedure:
  - *Acid Waste Benchtop Neutralization for Radioactive Mixed Waste From Elemental Analysis with ICP-MS*, prepared by Joern Larsen 09/07/07; approved by the LBNL Waste Management on 09/28/07
  - *Acid Waste Bench-top Neutralization for Acidic Radioactive/Mixed Waste*, prepared by Shaun Brown, 10/03/05; approved by the LBNL Waste Management on 10/12/05.
  - *Acid waste benchtop neutralization for Radioactive Mixed waste from Uranium Analysis with a KPA-* 6/2/2004
- Lockout/Tagout (LOTO) to Procedures initiated by the ESD PIs reviewed by EHS Division Subject Matter Expert
  - ICPMS-MS Main System and RF Generator Lockout/Tagout Procedure
  - ICP-MS DRC and Main System Lockout/Tagout Procedure
  - ICP-MS RF Generator Lockout/Tagout Procedure
- Activity Hazard Documents (controlled and maintained in the AHD database)
- Radiological Authorizations (controlled and maintained in RADAR database)
- Biological Authorizations/Notifications (controlled and maintained in the Biosafety Database)
- Laser Authorizations (controlled and maintained in the Laser Database)

The only controlled documents maintained by the ESD are ISM Plan and the active OSSEPPs and the Laboratory Procedures. These controlled documents shall be reviewed annually. If a document is changed based on this review, the revision number will be updated to indicate the updated versions, and the revision history shall list the main changes to the document. If no changes are required, the review will be documented in a memo to file and included in the original hardcopy maintained at the ESD Office.